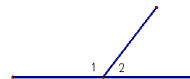


## 2-8 Continued

Theorem 2.3-The Supplement Theorem-If 2 angles form a linear pair, then they are supplementary.

How they are used:

Given: picture



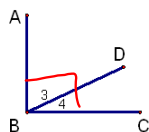
1.  $\angle 1$  and  $\angle 2$  are supplementary.

1. The Supplement Thm.

Theorem 2.4-The Complement Theorem-If the non-common rays of two adjacent angles form a right angle, then they are complementary.

Given:  $\overline{AB} \perp \overline{BC}$

- $\angle ABC$  is a right angle
- $\angle 3$  and  $\angle 4$  are complementary



- Def of  $\perp$
- The Complement Thm.

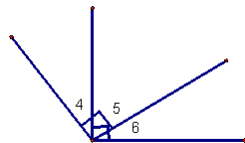
Theorem 2.6-Angles supplementary to same  $\angle$  or  $\cong \angle$ s are  $\cong$   
Short-- Supplements of  $\cong \angle$ s are  $\cong$

G:  $\angle 1 + \angle 2$  are supplementary  
 $\angle 3 + \angle 2$  are supplementary  
 Conclusion:  $\angle 1 \cong \angle 3$

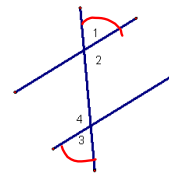
Theorem 2.7-Angles complementary to same  $\angle$  or  $\cong \angle$ s are  $\cong$   
Short-- Complements of  $\cong \angle$ s are  $\cong$

G:  $\angle 4 + \angle 5$  are complementary  
 $\angle 6 + \angle 7$  are complementary  
 $\angle 5 \cong \angle 6$   
 Conclusion:  $\angle 4 \cong \angle 7$

Prove Theorem 2.7

Given:  $\angle 5 + \angle 6$  are compl.  
 $\angle 4 + \angle 5$  are compl.Prove:  $\angle 4 \cong \angle 6$ 

Statements	Reasons
① $\angle 5 + \angle 6$ are compl. $\angle 4 + \angle 5$ are compl.	① Given
② $m\angle 5 + m\angle 6 = 90$ $m\angle 4 + m\angle 5 = 90$	② def. of compl.
③ $m\angle 5 + m\angle 6 = m\angle 4 + m\angle 5$	③ Subst.
④ $m\angle 5 = m\angle 5$	④ Refl.
⑤ $m\angle 6 = m\angle 4$	⑤ Subst.
⑥ $\angle 6 \cong \angle 4$	⑥ def of $\cong$
⑦ $\angle 4 \cong \angle 6$	⑦ symmetric

How they are used:  
Given:  $\angle 1 \cong \angle 3$ Prove:  $\angle 2 \cong \angle 4$ 1.  $\angle 1 \cong \angle 3$ 

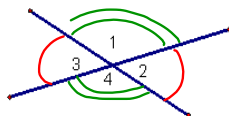
1. Given

2.  $\angle 1$  and  $\angle 2$  are supplementary.  
 $\angle 3$  and  $\angle 4$  are supplementary

2. The Supplement Thm.

3.  $\angle 2 \cong \angle 4$ 3. Supplements of  $\cong \angle$ s are  $\cong$ ~~2.8~~

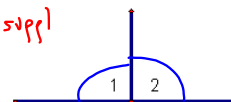
Theorem 2.8-Vertical Angles are congruent

Theorem 2.9-- $\perp$  lines form 4 right angles~~2.10~~ Theorem 2.10-All right  $\angle$ s are  $\cong$ Theorem 2.11-- $\perp$  lines form congruent, adjacent anglesTheorem 2.12-If 2  $\angle$ s are  $\cong$  and supplementary, then each is a right angleTheorem 2.13-If 2  $\cong \angle$ s form a linear pair, then each is a right angle.

Prove Theorem 2.12

Given:  $\angle 1 + \angle 2$  are suppl.  
 $\angle 1 \cong \angle 2$ 

Prove:

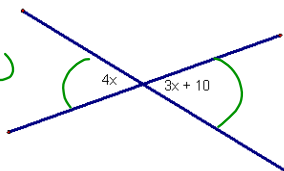
 $\angle 1$  is a rt.  $\angle$  $\angle 2$  is a rt.  $\angle$ 

Statements	Reasons
① $\angle 1 + \angle 2$ are suppl. $\angle 1 \cong \angle 2$	① Given
② $m\angle 1 + m\angle 2 = 180$	② def of suppl.
③ $m\angle 1 = m\angle 2$	③ def of $\cong$
④ $m\angle 1 + m\angle 1 = 180$	④ Subst.
⑤ $2m\angle 1 = 180$	⑤ Subst
⑥ $m\angle 1 = 90$	⑥ division
⑦ $m\angle 2 = 90$	⑦ Subst.
⑧ $\angle 1$ is a Rt. $\angle$ ; $\angle 2$ is a Rt. $\angle$	⑧ def of Rt. $\angle$ .

Solve for x.

$$4x = 3x + 10$$

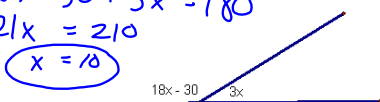
$$x = 10$$



$$18x - 30 + 3x = 180$$

$$21x = 210$$

$$x = 10$$

**Given:**  $\angle 1$  and  $\angle 2$  are supplementary**Conclusion:**  $m\angle 1 + m\angle 2 = 180$ **Reason:** Definition of supplementary angles**Given:**  $\angle 1$  and  $\angle 2$  are complementary**Conclusion:**  $m\angle 1 + m\angle 2 = 90$ **Reason:** Definition of complementary angles**Given:**  $\angle 1$  is a right angle**Conclusion:**  $m\angle 1 = 90$ **Reason:** Definition of right angles

Homework

p.112-113 #s 16-24, 27-32, 38